

# ON THE TAXONOMIC STATUS OF CERTAIN SPECIES OF *PAVETTA* (RUBIACEAE) FROM THE INDIAN SUBCONTINENT<sup>1</sup>

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The genus *Pavetta* L. (Rubiaceae) is represented by about 400 species in the Old World. It was intensively studied by Bremekamp (1934, 1939 a,b). He described 42 species and nine varieties from the Indian subcontinent, including 29 species and eight varieties as new. He, however, distinguished species sometimes on the basis of one or two quantitative characters. Very often a slight difference in length of the calyx teeth or hairiness of the leaf or corolla tube were sufficient for him to distinguish species. He also did not hesitate to postulate species on the basis of very incomplete or insufficient material bearing no flower or fruit. Due to unsatisfactory delimitation of taxa, Bridson (1978) and Kok and Grobbelaar (1984) synonymised a number of species.

We have been working on the taxonomy of the genus *Pavetta* in the Indian subcontinent, and are convinced that some taxa do not deserve the status given. These are presented below with their synonymy.

(1) *Pavetta gleniei* Hook. f. (1880: 152-153) was postulated on the basis of *Thwaites*, C. P. 2815 and *Walker* 14 from Sri Lanka. Bremekamp (1934) segregated *Walker* 14 and a part of *Thwaites*, C.P. 2815 to describe *P. malacophylla* Bremek., distinguishing it from the former species by the shorter calyx lobes, leaves beneath tomentose and midrib not prominent beneath. He further recognized in *P. gleniei* two varieties on the basis of hairiness of leaves, inflorescence and ovary. A study of the protologues along with the type specimens and other recent collections (which were not examined by Bremekamp) shows that *P. gleniei* varies in hairiness, length of calyx teeth (to

some extent) as well as in shape and colour of leaves, and these variations are continuous. Calyx teeth are 2.5-5.0 mm long, leaves are broadly elliptic to elliptic-lanceolate and brownish to black when dry. Corolla is similar in both species though Bremekamp appears to have overlooked examining it in *Thwaites*, C.P. 2815 a & b (K!) bearing one flower each. The inflorescence is densely pubescent or tomentose. The midrib is not "non prominente" in *P. malacophylla* as described by Bremekamp. Thus these are not taxonomically distinguishable and are synonymous as follows.

*Pavetta gleniei* Hook.f. Fl. Brit. Ind. 3: 152. 1880 (type: Sri Lanka, *Thwaites*, C.P. 2815 a holo. K!, iso. CAL!); Trimen, Hort. Zeyl. 43. 1888 & Fl. Ceyl. 2: 350.1894; Bremek. in Fedde Repert. 37: 80.1934.

*P. gleniei* Hook. f. var. *glabrescens* Bremek. (=var. *gleniei*) l.c. 81. (Type: *Thwaites* C.P. 2815a, holo. K!, photo CAL!), *nom surperf.*

*P. gleniei* Hook.f. var. *pubescens* Bremek. l.c. 81 (Type: *Thwaites*, C.P. 2815 b, holo. K!, photo CAL!) syn. nov.

*P. malacophylla* Bremek. l.c. 81 (Type: *Thwaites*, C. P. 2815 c, holo. K!, photo CAL!) syn. nov.

*P. tomentosa* Thw. Enum. Pl. Zeyl. 156. 1859, non Roxb. ex Smith, 1819.

*Ixora gleniei* (Hook.f.) Kuntze, Rev. Gen. Pl. 1: 286. 1891.

(2) In the subgen. 2 *Eupavetta* (= *Pavetta*) sect. *Pavettaster*, ser. 2 *Angustistipulae*, Bremekamp (1934: 81-82) described three species: *Pavetta travancorica*, *P. concanica* and *P. laeta* on the basis of two gatherings each. These species were distinguished by the shape and venation of leaves and the length of corolla tube: leaves being lanceolate in *P. travancorica*, elliptic in *P. concanica* and *P. laeta*; lateral ner-

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ves 10-12 pairs in *P. travancorica* and *P. concanica*, 6-9 pairs in *P. laeta* and corolla tube 6.5-8 mm in *P. travancorica* and *P. laeta*, 12-14 mm in *P. concanica*. A study of protologues and type specimens and other collections (not examined by Bremekamp) reveals that the leaves are variable from elliptic to elliptic-lanceolate or lanceolate with 8-12 pairs of lateral nerves; corolla tube is 6.5-12 mm long, depending partly on the varying stages of development. The form of stipules and their apices vary even on the same specimen. These variations evidently indicate that they are not taxonomically distinct, even as varieties. Accordingly the three species are reduced to one as follows.

*Pavetta travancorica* Bremek. in Fedde Repert. 37: 81. 1934 (Type: Travancore, June 1835, *R. Wight s.n.* (Kew Distrib. No. 1485, holo. K!, photo CAL!)).

*P. concanica* Bremek. l.c. 81 (type: Concan, *Law s.n.*, holo. K!, photo CAL!) syn. nov.

*P. laeta* Bremek. l.c. 82 (type: Tamil Nadu, Pulney Hills, 1914, *R.A. Sauliere* 673, holo. K!, photo CAL!) syn. nov.

(3) *Pavetta stocksii* Bremek. (1934: 113) was described on the basis of three gatherings: *Cooke s.n.*, *Tilak* 88 and *Stocks s.n.*, all extant at K. On describing this species the author stated "it is not impossible that this species and the last one (*P. crassicaulis*) are merely varieties of the same". A study of the protologues, the types as well as a paratype (*Tilak* 88 E!) shows that the hairiness on the underside of the leaf is variable, being softly to densely pubescent. Hence *P. stocksii* is reduced to a synonym as follows.

*Pavetta crassicaulis* Bremek. in Fedde Repert. 37: 112. 1934 & 47: 25. 1939 (type: Concan, *Stocks s.n.*, holo. K!, photo CAL!). *P. stocksii* Bremek. l.c. 113 (Type: loc.?, *Stocks s.n.* holo. K!, photo CAL!) syn. nov.

(4) *Pavetta birmahica* Bremek. (1934: 115) from Burma was distinguished into the varieties, namely var. *glabrescens* "folia supra glabrescentia" and var. *tomentosa* "folia utrimque tomentosa", the former being the typical

variety. According to the International Code of Botanical Nomenclature, the typical variety does not require a different varietal name. It is var. *birmahica*, where leaves are sparsely to densely pubescent on the upper surface, thereby it comes closer to var. *tomentosa*. Examination of types and other specimens shows that hairiness is variable to such an extent that the varieties do not stand and deserve to be merged. *P. gamblei* Bremek. (l.c. 114) was based on a single specimen *Gamble* 115. It agrees with *P. birmahica* in all respects except the length of the corolla tube (8 mm), which in *P. birmahica* is up to 6 mm long. It is likely to be at an earlier stage of development. Moreover, a species cannot be distinguished on slightly longer corolla tube only. In consideration of these facts these are merged here as follows.

*Pavetta birmahica* Bremek. in Fedde Repert. 37: 115. 1934 (Type: Burma, Thayetungo dist., Minhea, 17. 12. 1904, *J.H. Lace* 2698, holo. K! iso. CAL!).

*P. birmahica* Bremek. var. *glabrescens* Bremek. l.c. (=var. *birmahica*).

*P. birmahica* Bremek. var. *tomentosa* Bremek. l.c. (type: Burma, *Griffith* 3010, holo. K!, iso. CAL!) syn. nov.

*P. gamblei* Bremek. l.c. 114 (Type: Burma, Irawaddi. Mejanoung, 4. 5. 1872, *J. S. Gamble* 115, holo. K!, photo CAL!) syn. nov.

(5) In describing *Pavetta indica* L., Hook.f. (1880) considered about 20 names involved and treated them under five varieties, viz. var. *indica proper* (= *indica*), var. *polyantha*, var. *tomentosa*, var. *montana*, and var. *minor*. Bremekamp (1934) upgraded them as species and further postulated *P. amabilis*, *P. assamica*, *P. bengalensis*, *P. griffithii*, *P. neglecta*, *P. polyneura*, *P. thomsonii* and *P. praecox* and few varieties therein, on the basis of specimens treated by Hooker f. (l.c.) under those varieties. From a critical study of the specimens involved along with new gatherings not examined by Hook.f. or Bremekamp, we are convinced that Hook.f.'s treatment of the first three varieties

and the var. *montana* treated by Bremekamp as a species (*P. blanda*) are justified. The last variety, var. *minor*, treated by Bremekamp as a variety under a different species (*P. thomsonii* Bremek. var. *puberula* Bremek.) deserves a specific status. The other new species described by Bremekamp do not stand and become synonyms under the varieties of Hook.f.

*P. neglecta* Bremek. and *P. amabilis* Bremek. (1934: 92, 100) agree with *P. indica* L. var. *polyantha* Hook. f. with leaves narrowly obovate, oblanceolate or elliptic-lanceolate, acute or caudate at apex, acute at base, puberulous beneath or only on nerves, stipules ovate, cymes pubescent, flowers densely crowded. There is no difference in floral characters. The shape of leaves in *P. neglecta* described in the protologue as "rhomboidal" is actually found to be elliptic-lanceolate or obovate. In *P. amabilis*, the stipules described as "subquadrate cuspidate" are ovate cuspidate. *P. bengalensis* Bremek. and *P. polyneura* Bremek. (1934: 99, 120) agree with each other in all respects and differ from *P. indica* L. var. *polyantha* Hook.f. in leaves broadly obovate, pubescent on the nerves beneath. *P. griffithii* Bremek. (1934: 99) differs from it in leaves lanceolate, corolla tube pubescent at throat. *P. assamica* Bremek. (1934: 119) differs from the same in having small leaves, broadly elliptic with slender lateral nerves closely arranged. The leaf shape and hairiness are variable in this taxon. So, these differences are not taxonomically justified and these species do not deserve any infra specific status even and are synonymous with *P. indica* L. var. *polyantha* Hook.f.

*P. praecox* Bremek. (1934: 114) was based on a single gathering, Ritchie 352. It is characterised by small broadly elliptic (4x3 cm) leaves, obtuse at both ends. It agrees fully with *P. indica* L. var. *tomentosa* (Roxb. ex Sm.) Hook.f. where leaves are variable in size (4-26.5 x 1-12 cm), shape, hairiness etc. The apex may be acute, acuminate, subacute, obtuse or rounded. There is no difference in floral characters. So *P. praecox*

does not stand as a distinct species. *P. indica* L. var. *mollis* Bremek. (l.c. 199) was based on Gamble 15021 and Campbell 60 and 259. It agrees fully with *P. indica* L. var. *tomentosa* (Roxb. ex Sm.) Hook.f. in the hairiness of stem, leaves and inflorescence. There is no distinction in floral characters and it is therefore synonymous with the latter variety.

*P. blanda* Bremek. (1934: 94) was based on specimens (including type) of *P. indica* L. var. *montana* Hook.f. (1880: 150) and some Indian specimens belonging to *P. indica* L. var. *minor* Hook.f. (l.c.) and *P. breviflora* DC. var. *subcoriacea* Gamble. This species appears to be limited to Sri Lanka only. The Indian specimens included under it by Bremekamp are different and are treated under other species or varieties.

*P. thomsonii* Bremek. (1934: 99) var. *glaberrima* Bremek. (= *thomsonii*) was based on specimens belonging to *P. indica* var. *indica*. It fully agrees with *P. indica* L. var. *indica* and deserves to be merged with it. *P. thomsonii* Bremek. var. *puberula* Bremek. (l.c.) was based on specimens (including types) belonging to *P. indica* L. var. *minor* Hook.f. (1880: 150). It is distinct from *P. indica* in the leaves being narrowly oblanceolate or elliptic-lanceolate, acute or acuminate at apex, calyx teeth long, subulate, acute, puberulous, cymes puberulous. It deserves to be treated as a distinct species. Hence a new combination is made, raising it to specific status.

The taxonomic status and synonymy of *P. indica* L. are as follows.

*Pavetta indica* L., Sp. Pl. 110. 1753 (Type: Sri Lanka, Herman 56 BM); Hook.f. Fl. Brit. Ind. 3: 150. 1880; Bremek. in Fedde Repert. 37: 118. 1934.

*Ixora indica* (L.) Kuntze, Rev. Gen. Pl. 1: 286. 1891.

*I. paniculata* Lam. Encycl. 3: 344. 1789.

*I. pavetta* Roxb. Hort. Beng. 11. 1814 *nom. nud.* & Fl. Ind. 1: 396. 1820, *non* Andrews, 1799.

*Pavetta alba* Vahl. symb. Bot. 3: 11. 1794.



- P. obtusa* Pers. Syn. 1: 131. 1805.  
 (a) var. *indica*  
*P. indica* L. var. *glabra* Blatter & Hallberg in J. Bombay nat. Hist. Soc. 36: 792. 1933.  
*P. indica* L. var. *glabra* Bremek. in Fedde Repert. 37: 119. 1934.  
*P. indica* L. var. *indica proper* Hook.f. Fl. Brit. Ind. 3: 150. 1880.  
*P. thomsonii* Bremek. var. *glaberrima* Bremek. (= *thomsonii*) in Fedde Repert. 37: 99. 1934 (Type: Mysore, *Thomson s.n.*, holo. K!, photo CAL!) syn. nov.  
*P. thomsonii* Bremek. var. *thomsonii* B.D. Sharma et al. Fl. Kern. 131. 1984.  
*P. blanda* Bremek. in Fedde Repert. 37: 94. 1934, p.p.  
 (b) var. *glabrescens* (Kurz) Deb et Rout comb. nov.  
*Basionym*: *Ixora tomentosa* var. *glabrescens* Kurz, For. Fl. Brit. Burm. 2: 19. 1877 (Type: Burma, Pegu, 23.2.1871, *S. Kurz* 3057 CAL, right hand specimen is selected as the lectotype, the other sheet of the same no. is isolecoto.).  
*P. tomentosa* Roxb. ex Sm. var. *glabrescens* (Kurz) Bremek. l.c. 114.  
*P. amabilis* Bremek. in Fedde Repert. 37: 100. 1934 (Type: Upper Burma, 1911-12, *S.M. Toppin* 3032, holo. E!, iso. CAL!) syn. nov.  
*P. assamica* Bremek. in Fedde Repert. 37: 119. 1934 (Type: Assam, Guahati, *Simons* 16, holo. K!, photo CAL!) syn. nov.  
*P. bengalensis* Bremek. in Fedde Repert. 37: 99. 1934 (Type: Bengal, Nov. 1850, *Hooker & Thomson s.n.*, holo. K!, photo CAL!) syn. nov.  
*P. griffithii* Bremek. in Fedde Repert. 37: 99. 1934 & 47: 22. 1939 (Type: Bhutan, *Griffith* 2114, holo. K!, photo CAL!) syn. nov.  
*P. indica* L. var. *polyantha* Hook.f. Fl. Brit. Ind. 3: 150. 1880 (type: Meghalaya, Silhet Mt. (Jowai), *F.De Silva s.n.* ex *Wall. Cat.* 6176, holo. K!, photo & microfiche CAL!).  
*P. indica* Wall. Cat. 6175 F, *nom. nud.*  
*P. neglecta* Bremek. in Fedde Repert. 37: 92. 1934 (Type: Mizoram, S. Lushai Hills, Thady forest, 1050 m, Aug. 1928, *Wenger* 214, holo. K!, photo CAL!) syn. nov.  
*P. polyantha* Wall. Cat. 6176, *nom. nud.*  
*P. polyantha* (Hook.f.) Bremek. in Fedde Repert. 37: 103. 1934 & 47: 22. 1939. syn. nov.  
*P. polyneura* Bremek. in Fedde Repert. 37: 119. 1934 (Type: Burma, S. Tenasserim, Kyein Chaum, 12. 2. 1926, *Maung Law Tek* 1379, holo. K!, photo CAL!) syn. nov.  
*P. rothiana* DC. Prodr. 4: 1830.  
*P. villosa* Heyne in Roth, nov. sp. 89. 1821, *non* Vahl 1794.  
 As per Art. 56.1 of ICBN (1988) the new combination at the varietal status is necessary.  
 (c) var. *tomentosa* (Roxb. ex Smith) Hook.f. Fl. Brit. Ind. 3: 150. 1880.  
*P. tomentosa* Roxb. ex Smith in Rees Cycl. 26, n. 2, 1819 (Type: *Roxb. ill.* no. 169 CAL! as in Wight Icon. t. 186. 1840); Bremek. in Fedde Repert. 37: 113. 1934 p.p.  
*P. tomentosa* Roxb. ex Smith var. *roxburghii* (Kurz) Bremek. l.c. 114.  
*P. indica* L. ssp. *tomentosa* (Roxb. ex Smith) Bennet, Fl. How. 356. 1979 & Name change. Fl. Pl. 415. 1987.  
*P. indica* L. var. *mollis* Bremek. in Fedde Repert. 37: 119. 1934 (type: Andhra Pradesh, Cuddaph dist., Guvalacharam Ghat, 300 m, July 1884, *J.S. Gamble* 15021, holo. K!, photo CAL! iso. CAL! MH!) syn. nov.  
*P. praecox* Bremek. in Fedde Repert. 37: 114. 1934 (Type: Karnataka, Canara, Belgaum, April 1831, *Ritchie* 352, holo. K!, photo CAL!) syn. nov.  
*Ixora roxburghii* Kuntze, Rev. Gen. Pl. 1: 296. 1891.  
*I. tomentosa* Roxb. Hort. Beng. 11. 1814, *nom. nud.* & Fl. Ind. 1: 396. 1820  
 (d) *P. blanda* Bremek. in Fedde Repert. 37: 94. 1934 p.p. (excl. synonyms and Indian specimens).  
*P. indica* L. var. *montana* Hook. f. Fl. Brit. Ind. 3: 150. 1880 (Type: Sri Lanka, 900-1200 m, 1854, *Thwaites*, *C.P.* 2456, holo. K! iso. BM!

CAL!).

*P. indica* Thw. Enum. Pl. Zeyl. 155. 1859  
(excl. var. r & O).

(e) *P. minor* (Hook.f.) Deb & Rout comb.  
et stat. nov.

Basionym: *P. indica* L. var. *minor* Hook.f.  
Fl. Brit. Ind. 3: 150. 1880 (Type: Tamil Nadu,

Shevaghiry hills, *R. Wight s.n.* (Kew Distrib. No.  
1483), holo. K!, photo CAL!).

*P. blanda* Bremek. in Fedde Repert. 37: 94.  
1934 p.p. (excl. type from Sri Lanka)

*P. thomsonii* Bremek. var. *puberula*  
Bremek. in Fedde Repert. 37: 99. 1934.

#### REFERENCES

- BREMEKAMP, C.E.B. (1934): A monograph of the genus  
*Pavetta* L. *Rep. spec. nov. reg. veg.* (Fedde Repert.)  
37: 1-208.
- BREMEKAMP, C.E.B. (1939 a): A monograph of the genus  
*Pavetta* L.: Additions and amendations. *Rep. Spec.  
nov. reg. veg.* 47: 12-28.
- BREMEKAMP, C.E.B. (1939 B): A monograph of the genus  
*Pavetta* L. Additions and amendations II. *Rep. spec.  
Nov. reg. veg.* 47: 81-98.
- BRIDSON, D.M. (1978): Studies on *Pavetta* (Rubiaceae: sub-  
fam. Cinchonoideae) for part 2 of flora of Tropical  
East Africa: Rubiaceae. *Kew Bull.* 32: 609-652.
- HOOKE, J.D. (1880): The Flora of British India, vol. 3. L.  
Reeve & Co. Ltd., Ashford, Kent.
- KOK, P.D.F. & GROBBELAAR, N. (1984): Studies on *Pavetta*  
(Rubiaceae) II. Enumeration of species and  
synonymy. *S. Afr. J. Bot.* 3(3): 185-187.